

REMARKS

In the Office Action, Claims 9, 10, 15, 30, 31, 40, 41, and 46 are pending and stand rejected. In response, Claims 9, 30, and 40 are amended, no claims are cancelled and no claims are added. Applicants respectfully request reconsideration of pending claims in view of the above amendments and the following remarks.

I. Drawing Objection

FIG. 32 of the Drawings has been objected to. In response, Applicant submits a corrected drawing sheet bearing the designation "Prior Art" with reference to FIG. 32. Therefore, Applicant respectfully requests reconsideration and withdrawal of the objection.

II. Claim Rejections Under 35 U.S.C. §112

Claims 10, 15, 31, 41, and 46 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Applicant respectfully disagrees.

The spread signal S refers to a signal obtained by spreading a digital signal. Meanwhile, the spreading code C is a code used for the foregoing spreading process. Here, the symbol C_i represents i^{th} term or bit of the spreading code C ($1 \sim M$; M being a code length). P refers to a correlation value obtained as a result of a despreading process that becomes equal to a code length M when the spread signal S is in phase with the spreading code C, while P become -1 when the spread signal S is out of phase with the spreading code C.

Generally in spread spectrum communication, the same spreading code C as that used in the spreading process is used in despreading process as well. That is to say, a process equivalent to that represented by the first line of the equation (1) below, given in the specification.

$$\begin{aligned} P &= C_1 \cdot S_1 + C_2 \cdot S_2 + \cdots + C_M \cdot S_M \\ &= \sum_{k=1}^M (C_k \cdot S_k) \quad \cdots \quad (a) \end{aligned}$$

In the next place, the “differentiated spread signal ΔS ” means a signal received at the reception antenna of the radio receiver, as can be understood from the description in the eighth embodiment of the present invention that “operation of communicating the high-frequency of the spread signal S by radio equals radio communication of a signal prepared by performing differential operation (differential modulation) for the spread signal S .”

In the eighth embodiment of the present invention, it is taught that the differentiated spread signal ΔS is despread by using the spreading code C which satisfies equation (3). Then, when comparing the foregoing equation (a) with the equation (3), the spreading code C' used for the despreading process may be expressed as follows:

$$C'_k = \sum_{r=k}^M C_r \quad \dots\dots (b)$$

For example, if a PN code $C = \{1, -1, -1, 1, 1, 1, -1\}$ with a code length of 7 described in the eighth embodiment of the invention is used for the spreading process, the spreading code C'_1, C'_3, C'_7 , for example, may be determined as follows:

$$C'_1 = C_1 + C_2 + \dots + C_7 = 1 - 1 - 1 + 1 + 1 + 1 - 1 = 1$$

$$C'_3 = C_3 + C_4 + \dots + C_7 = -1 + 1 + 1 + 1 - 1 = 1$$

$$C'_7 = C_7 = -1$$

Thus, it follows that the spreading code sequence $C' = \{1, 0, 1, 2, 1, 0, -1\}$ may be used for the despreading process. Referring to Fig. 5 of the present invention, the input signals are sequentially held in the sample-and-hold circuits first from the leftmost one toward the rightmost one so that the input signals are held therein in a reverse sequence to the sequence the input signals are disposed from right to left as they are input, namely the signal input first comes the rightmost position, as viewed in Fig. 5, for example. Then, in a case where the despreading means shown in Fig. 5 is to be used, it will be advisable to arrange so as to invert the spreading code sequence output from the spreading code generation circuit 434, as well. That is to say, the inversion of the foregoing spreading code sequence $C' = \{1, 0, 1, 2, 1, 0, -1\}$ becomes the spreading code sequence $\{-1, 0, 1, 2, 1, 0, 1\}$ used for the despreading process taught in the eighth embodiment of the present invention.

As explained in detail above, we believe that any person skilled in the art can fully carry out the invention claimed in the claims 10, 31, and 41 in view of the substance of these claims and the description of the eighth embodiment associated therewith. Reconsideration and withdrawal of the rejection is respectfully requested.

III. Claims Rejected Under 35 U.S.C. §103

Claims 9, 15, 30, 40, and 46 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 7,257,148 to Suzuki ("Suzuki") in view of U.S. Patent 5,959,550 to Giles ("Giles") and U.S. Patent 6,345,073 to Curry et al. ("Curry"). Applicant respectfully traverses this rejection.

Suzuki generally relates to a radio transmitting apparatus and a radio receiving apparatus that are prevented from causing and undergoing interference when another system is used in the same area. The interference referred to by Suzuki relates to interference between ultra wide bandwidth or UWB radio transmissions within the 5-GHz range and wireless land networks which transmit in a 5-GHz range. (See column 3, lines 32-52 and column 4, lines 1-3.) In contrast with Claim 9, Suzuki does not teach or suggest a decoding means that comprises de-spreading means for performing de-spreading of the signal received by said reception antenna by using a spreading code corresponding to a differentiated spread signal.

According to the Examiner, this de-spreading means of Claim 9 is disclosed by column 6, lines 1-6 and 46-62, as well as Figure 3, blocks 317, 302 and 303. However, the portions of Suzuki referred to by the Examiner describe multiplication of the received signal by impulses having a spread code sequence superimposed on them in a half-chip timing period behind the spread code sequence to perform the de-spreading process. We submit that neither column 6, lines 46-62 nor any other portion of Suzuki teaches or suggests the spreading means for performing de-spreading of a receive signal by a reception antenna using a spreading code corresponding to a differentiated spread signal, as in Claim 9. Hence, the multiplication of a receive by impulses having a spread code with a half-chip period timing fails to teach or suggest the de-spreading of a receive signal using a spreading code corresponding to a differentiated spread signal as in Claim 9.

As correctly recognized by the Examiner, Suzuki fails to teach or suggest using a code not containing a DC component signal and a peak detection means for detecting a peak of the

signal de-spread by said de-spreading means and restoring the digital signal, as in Claim 9. As a result, the Examiner recites Giles and Curry to provide the missing features of Claim 9. However, the Examiner's citing of both Giles and Curry fails to teach or suggest a decoding means wherein a signal received by a reception antenna is de-spread using a spreading code corresponding to a differentiated spread signal, as in Claim 9.

Thus, the Examiner has failed to identify and we are unable to discern any portion of Suzuki, Giles or Curry that teaches or suggest de-spreading using a spreading code corresponding to a differentiated spread signal, as in Claim 9. Hence, no combination of Suzuki, Giles or Curry teaches or suggests a decoding means wherein a signal received by a reception antenna is de-spread using a spreading code corresponding to a differentiated spread signal, as in Claim 9.

For each of the above reasons, therefore, Claim 9 and all claims which depend from Claim 9 are patentable over the cited art. Therefore, we respectfully request that the Examiner reconsider and withdraw the 103(a) rejection of Claims 9 and 15.

Claims 30 and 40 describe a decoding means wherein "a signal received by a reception antenna is despread using a spreading code corresponding to a differentiated spread signal," which is not taught or suggested by Suzuki, Giles, or Curry. Consequently, each of Applicants' other independent claims, including Claims 30 and 40, includes limitations similar to those highlighted with reference to Claim 9. Therefore, all of Applicants' other independent claims including Claims 30 and 40, and all claims which depend on them, are patentable over the cited art, for similar reasons. Consequently, Applicants respectfully request that the Examiner reconsider and withdraw the §103 (a) rejection of Claims 30, 40, and 46.

DEPENDENT CLAIMS

In view of the above remarks, a specific discussion of the dependent claims is considered to be unnecessary. Therefore, Applicant's silence regarding any dependent claim is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending (1) are in proper form, (2) are neither obvious nor anticipated by the relied upon art of record, and (3) are in condition for allowance. A Notice of Allowance is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

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Dated: September 9, 2008

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CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being submitted electronically via EFS Web on the date shown below to the United States Patent and Trademark Office.


Linda Metz

9-9-08
September 9, 2008